Sacramento River Temperature Task Group Meeting

February 26, 2014
1:00 pm

Conference Line: 877-718-6527
Pass code: 1954134

Agenda

1. Introductions

2. Fishery update

3. Hydrology & Operations update
    a. Daily CVP Water Supply Report ***
    b. Drought outlook graph***
    c. Snow water content***
    d. February 90% and 50% forecasts ***

4. Discussion of recent temperature model runs
    a. 90% & 50% Temperature run ***

5. Hindcast report

6. Next meeting – Weekly meetings needed?

***handouts

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CENTRAL VALLEY PROJECT-CALIFORNIA

DAILY CVP WATER SUPPLY REPORT

FEBRUARY 23, 2015

RUN DATE: February 24, 2015

RESERVOIR RELEASES IN CUBIC FEET/SECOND

RESERVOIR	DAM	WY 2014	WY 2015	15 YR MEDIAN
TRINITY	LEWISTON	314	307	307
SACRAMENTO	KESWICK	2,731	2,975	3,882
FEATHER	OROVILLE (SWP)	950	950	1,750
AMERICAN	NIMBUS	585	830	1,532
STANISLAUS	GOODWIN	204	402	381
SAN JOAQUIN	FRIANT	131	142	109

STORAGE IN MAJOR RESERVOIRS IN THOUSANDS OF ACRE-FEET

RESERVOIR	CAPACITY	15 YR AVG	WY 2014	WY 2015	% OF 15 YR AVG
TRINITY	2,448	1,649	1,180	1,136	69
SHASTA	4,552	3,159	1,731	2,589	82
OROVILLE (SWP)	3,538	2,128	1,389	1,717	81
FOLSOM	977	477	290	559	117
NEW MELONES	2,420	1,503	1,058	606	40
FED. SAN LUIS	966	759	370	364	48
MILLERTON	520	305	172	193	63
TOT. N. CVP	11,360	7,548	4,629	5,254	70

ACCUMULATED INFLOW FOR WATER YEAR TO DATE IN THOUSANDS OF ACRE-FEET

RESERVOIR	CURRENT WY 2015	DRIEST WY 1977	WETTEST WY 1983	15 YR AVG	% OF 15 YR AVG
TRINITY	676	54	694	381	178
SHASTA	2,288	1,109	3,966	2,128	108
FOLSOM	506	155	2,184	706	72
NEW MELONES	181	0	730	259	70
MILLERTON	63	97	1,081	275	23

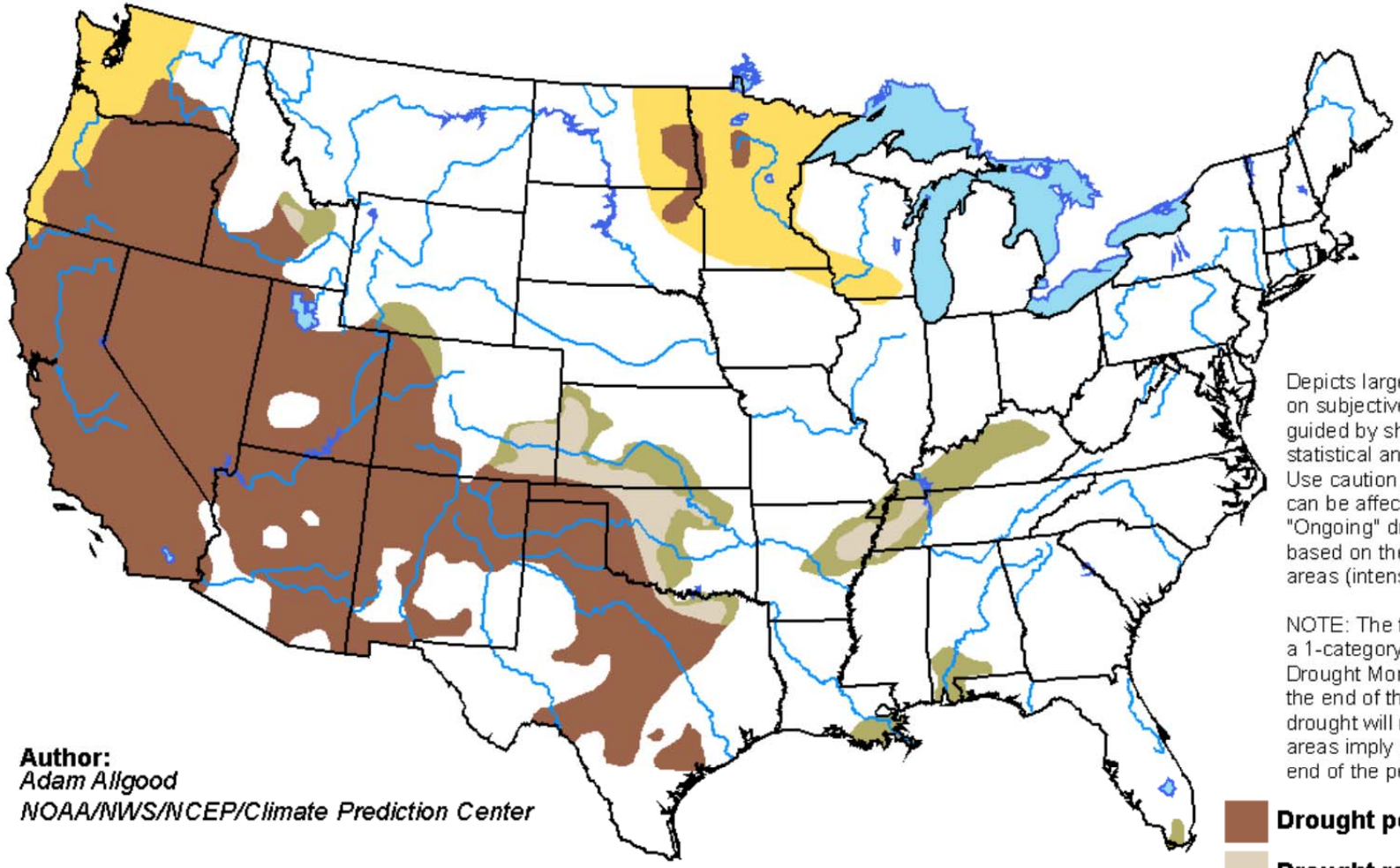
ACCUMULATED PRECIPITATION FOR WATER YEAR TO DATE IN INCHES

RESERVOIR	CURRENT WY 2015	DRIEST WY 1977	WETTEST WY 1983	AVG (N YRS)	% OF AVG	LAST 24 HRS
TRINITY AT FISH HATCHERY	22.32	6.18	32.03	22.14 (53)	101	0.00
SACRAMENTO AT SHASTA DAM	44.50	7.79	61.55	41.66 (58)	107	0.00
AMERICAN AT BLUE CANYON	36.45	11.07	65.39	42.60 (40)	86	0.00
STANISLAUS AT NEW MELONES	15.02	0.00	27.75	17.60 (37)	85	0.00
SAN JOAQUIN AT HUNTINGTON LK	10.60	7.60	52.30	26.60 (40)	40	0.00

U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for February 19 - May 31, 2015
Released February 19, 2015



Depicts large-scale trends based on subjectively derived probabilities guided by short- and long-range statistical and dynamical forecasts. Use caution for applications that can be affected by short lived events. "Ongoing" drought areas are based on the U.S. Drought Monitor areas (intensities of D1 to D4).

NOTE: The tan areas imply at least a 1-category improvement in the Drought Monitor intensity levels by the end of the period, although drought will remain. The green areas imply drought removal by the end of the period (D0 or none).

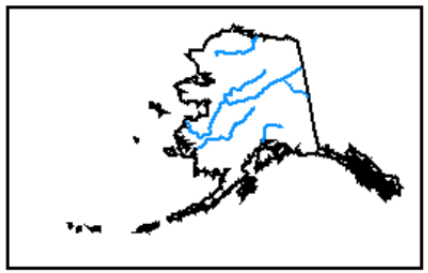
Drought persists/intensifies

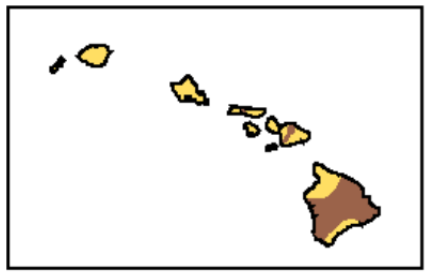
Drought remains but improves

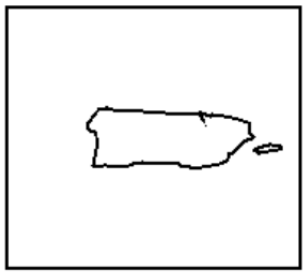
Drought removal likely

Drought development likely

Author:
Adam Allgood
NOAA/NWS/NCEP/Climate Prediction Center



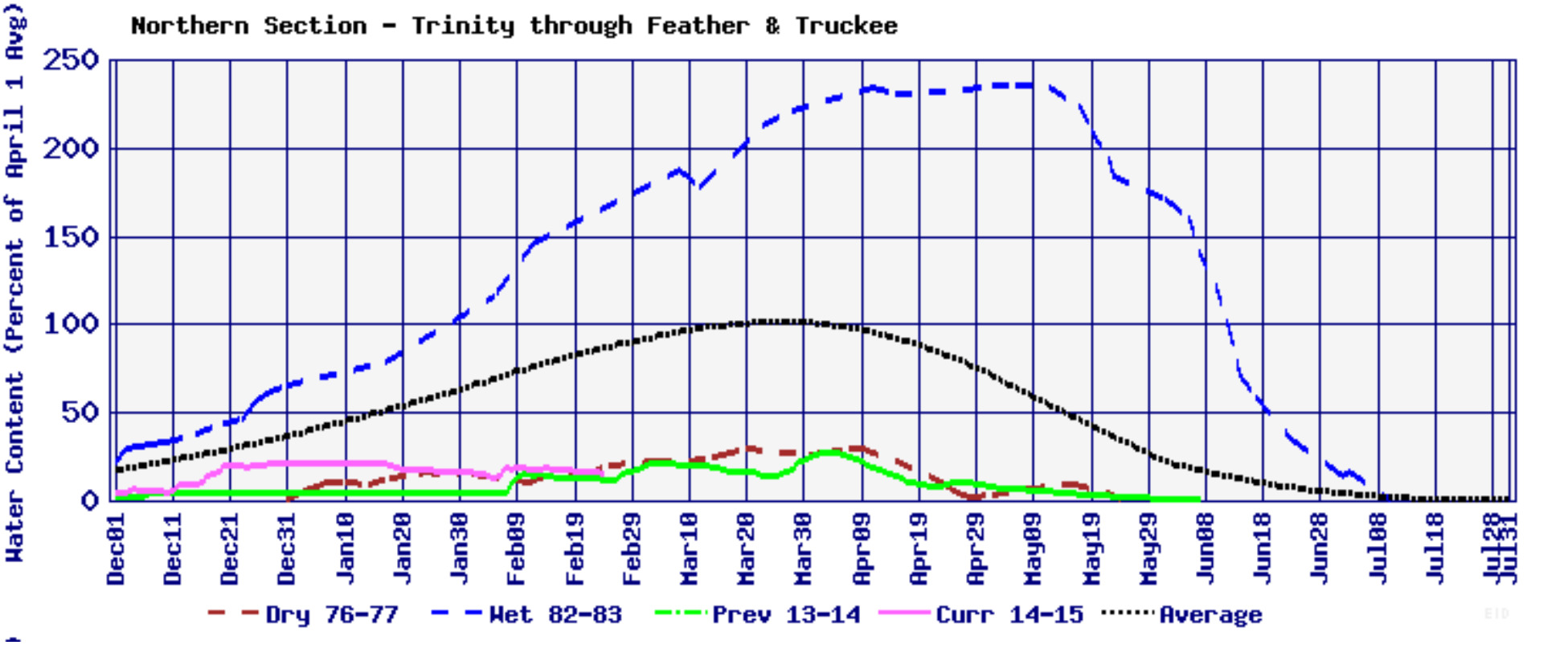




http://go.usa.gov/hHTe

California Snow Water Content

PERCENT OF APRIL 1 AVERAGE, FEBRUARY 24, 2015



90%

Storages

Federal End of the Month Storage/Elevation (TAF/Feet)

		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Trinity	**874**	**1112**	**1177**	**1178**	**1017**	**908**	**806**	**702**	**642**	**611**	**578**	**562**	**570**
	Elev.	2267	2274	2274	2257	2244	2232	2217	2209	2204	2198	2196	2197
Whiskeytown	**205**	**206**	**206**	**238**	**238**	**238**	**238**	**238**	**230**	**206**	**206**	**206**	**206**
	Elev.	1199	1199	1209	1209	1209	1209	1209	1207	1199	1199	1199	1199
Shasta	**2001**	**2671**	**2856**	**2746**	**2471**	**2169**	**1766**	**1471**	**1324**	**1299**	**1345**	**1416**	**1537**
	Elev.	993	1001	996	983	967	943	923	912	911	914	919	928
Folsom	**448**	**542**	**559**	**554**	**549**	**465**	**293**	**224**	**192**	**182**	**177**	**181**	**196**
	Elev.	422	424	423	423	412	386	373	365	362	361	362	366
New Melones	**563**	**600**	**559**	**488**	**385**	**299**	**206**	**119**	**63**	**49**	**54**	**61**	**63**
	Elev.	878	870	855	831	808	778	741	707	696	700	706	707
San Luis	**347**	**372**	**392**	**366**	**313**	**219**	**103**	**23**	**72**	**163**	**196**	**324**	**505**
	Elev.	479	475	459	439	414	387	366	369	388	411	443	473
Total		5502	5750	5570	4973	4297	3412	2777	2523	2510	2556	2750	3076

State End of the Month Reservoir Storage (TAF)

Oroville	**1444**	**1740**	**1828**	**1761**	**1633**	**1408**	**1176**	**1012**	**971**	**964**	**871**	**865**	**943**
	Elev.	757	766	759	745	720	690	666	660	659	643	642	655
San Luis	**756**	**900**	**839**	**702**	**555**	**423**	**323**	**255**	**227**	**271**	**420**	**578**	**721**
Total San Luis (TAF)	**1103**	**1272**	**1231**	**1068**	**868**	**642**	**426**	**278**	**299**	**434**	**617**	**902**	**1225**

Monthly River Releases (TAF/cfs)

Trinity	TAF	17	18	32	180	47	28	28	27	23	18	18	18
	cfs	**300**	**300**	**540**	**2,924**	**783**	**450**	**450**	**450**	**373**	**300**	**300**	**300**
Clear Creek	TAF	10	11	9	9	9	7	5	9	11	10	11	11
	cfs	**175**	**175**	**150**	**150**	**150**	**120**	**85**	**150**	**175**	**175**	**175**	**175**
Sacramento	TAF	180	200	350	454	506	589	479	297	251	202	200	200
	cfs	**3250**	**3250**	**5881**	**7383**	**8500**	**9579**	**7800**	**5000**	**4077**	**3394**	**3250**	**3250**
American	TAF	50	49	52	49	98	182	87	48	49	48	50	49
	cfs	**900**	**800**	**868**	**800**	**1645**	**2964**	**1418**	**802**	**800**	**800**	**807**	**800**
Stanislaus	TAF	14	25	30	29	16	19	14	9	35	15	13	18
	cfs	**255**	**403**	**503**	**465**	**270**	**316**	**232**	**153**	**573**	**260**	**205**	**295**
Feather	TAF	53	49	131	49	116	141	108	77	55	54	55	55
	cfs	**950**	**800**	**2200**	**800**	**1950**	**2300**	**1750**	**1300**	**900**	**900**	**900**	**900**

Trinity Diversions (TAF)

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Carr PP	2	0	34	18	77	78	77	32	15	28	19	6
Spring Crk. PP	**3**	**9**	**8**	**15**	**70**	**70**	**70**	**30**	**30**	**19**	**12**	**3**

Delta Summary (TAF)

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Tracy	50	75	45	61	46	45	45	133	146	65	148	200
USBR Banks	0	0	0	0	0	0	0	0	0	0	0	0
Contra Costa	7	7	11.4	11.4	11.4	9.9	10.6	11.4	7	8.4	9.2	9.2
Total USBR	57	82	56	73	57	55	56	144	153	73	157	209
State Export	225	75	18	15	35	45	45	30	75	165	181	200
Total Export	282	157	74	88	92	100	101	174	228	238	338	409
COA Balance	0	0	-22	-22	-64	-55	-48	-38	-38	-38	-39	-39
Old/Middle River Std.												
Old/Middle R. calc.	-4,070	-2,060	-924	-1,216	-1,536	-1,575	-1,636	-2,635	-2,939	-3,302	-4,492	-5,319
Computed DOI	9527	4604	7396	4425	4001	4002	2993	3009	2993	3496	3497	5482
Excess Outflow	2431	602	0	423	0	0	0	0	0	0	0	1985
% Export/Inflow	36%	35%	11%	17%	16%	15%	18%	32%	44%	48%	60%	58%
% Export/Inflow std.	45%	35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%

Hydrology

	Trinity		Shasta		Folsom		New Melones	
Water Year Inflow (TAF)	894		3,792		856		248	
Year to Date + Forecasted % of mean	74%		68%		31%		23%	

Storages

Federal End of the Month Storage/Elevation (TAF/Feet)

		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Trinity	**874**	**1117**	**1279**	**1373**	**1220**	**1028**	**873**	**751**	**636**	**585**	**579**	**617**	**682**
	Elev.	2268	2284	2292	2278	2258	2240	2224	2208	2199	2198	2205	2214
Whiskeytown	**205**	**206**	**206**	**238**	**238**	**238**	**238**	**238**	**230**	**230**	**225**	**206**	**206**
	Elev.	1199	1199	1209	1209	1209	1209	1209	1207	1207	1205	1199	1199
Shasta	**2001**	**2703**	**3129**	**3296**	**3208**	**2843**	**2423**	**2085**	**1954**	**1912**	**1961**	**2164**	**2577**
	Elev.	994	1013	1020	1017	1001	980	962	955	952	955	967	988
Folsom	**448**	**564**	**673**	**704**	**759**	**639**	**450**	**340**	**299**	**298**	**314**	**349**	**424**
	Elev.	424	437	440	445	433	410	394	387	387	390	395	406
New Melones	**563**	**600**	**613**	**588**	**532**	**466**	**384**	**308**	**258**	**249**	**269**	**296**	**327**
	Elev.	878	880	876	864	850	831	810	795	793	799	807	816
San Luis	**347**	**392**	**512**	**427**	**268**	**141**	**55**	**64**	**135**	**285**	**496**	**657**	**815**
	Elev.	473	483	457	420	385	352	340	353	395	441	472	501
Total		5581	6413	6625	6225	5355	4422	3785	3512	3559	3843	4289	5029

State End of the Month Reservoir Storage (TAF)

Oroville	**1444**	**1790**	**2055**	**2185**	**2083**	**1891**	**1677**	**1515**	**1447**	**1412**	**1393**	**1458**	**1715**
	Elev.	762	788	800	790	772	750	732	724	720	718	726	754
San Luis	**756**	**825**	**805**	**617**	**426**	**264**	**142**	**73**	**67**	**198**	**391**	**542**	**700**
Total San Luis (TAF)	**1103**	**1217**	**1317**	**1044**	**694**	**405**	**198**	**136**	**202**	**482**	**887**	**1200**	**1514**

Monthly River Releases (TAF/cfs)

Trinity	TAF	17	18	32	258	126	68	28	27	23	18	18	18
	cfs	**300**	**300**	**540**	**4,189**	**2,120**	**1,102**	**450**	**450**	**373**	**300**	**300**	**300**
Clear Creek	TAF	10	11	10	11	9	7	7	9	12	12	11	11
	cfs	**175**	**175**	**175**	**175**	**150**	**120**	**120**	**150**	**200**	**200**	**175**	**175**
Sacramento	TAF	180	200	268	430	666	679	584	369	307	268	200	200
	cfs	**3250**	**3250**	**4500**	**7000**	**11200**	**11041**	**9500**	**6200**	**5000**	**4500**	**3250**	**3250**
American	TAF	50	111	153	98	195	246	170	101	77	74	77	77
	cfs	**900**	**1800**	**2567**	**1600**	**3273**	**4000**	**2762**	**1690**	**1250**	**1250**	**1250**	**1250**
Stanislaus	TAF	14	25	30	29	16	19	14	9	35	15	13	18
	cfs	**255**	**403**	**503**	**465**	**270**	**316**	**232**	**153**	**573**	**260**	**205**	**295**
Feather	TAF	53	58	57	58	89	127	123	89	58	57	58	61
	cfs	**950**	**950**	**950**	**950**	**1500**	**2070**	**2000**	**1500**	**950**	**950**	**950**	**1000**

Trinity Diversions (TAF)

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Carr PP	1	3	42	31	93	97	98	91	40	19	1	1
Spring Crk. PP	**35**	**30**	**23**	**35**	**90**	**90**	**90**	**90**	**30**	**19**	**25**	**25**

Delta Summary (TAF)

		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Tracy		60	220	48	49	145	231	278	270	282	270	200	200
USBR Banks		0	0	0	0	11	11	11	0	0	0	0	0
Contra Costa		7	6.35	11.35	11.35	9.9	10.55	11.35	12	8.4	9.2	9.15	7
Total USBR		67	226	59	61	166	253	300	282	290	279	209	207
State Export		200	170	42	43	65	68	74	80	189	235	200	200
Total Export		267	396	101	104	231	321	374	362	479	514	409	407
COA Balance		0	0	-19	-19	-8	1	0	0	0	0	0	0
Old/Middle R. std.													
Old/Middle R. calc.		-3,651	-4,795	-1,265	-1,276	-3,238	-4,243	-4,984	-4,972	-5,934	-6,697	-5,198	-5,131
Computed DOI		23737	18122	10977	7841	7094	4002	2993	3009	3009	3816	9337	13030
Excess Outflow		16641	11013	0	732	0	0	0	0	16	319	5840	9533
% Export/Inflow		17%	26%	11%	14%	27%	38%	47%	51%	63%	65%	41%	35%
% Export/Inflow std.		45%	35%	35%	35%	35%	65%	65%	65%	65%	65%	65%	65%

Hydrology

	Trinity		Shasta		Folsom		New Melones	
Water Year Inflow (TAF)	1226		4,547		1,479		513	
Year to Date + Forecasted % of mean	101%		82%		54%		49%	

CVP actual operations do not follow any forecasted operation or outlook; actual operations are based on real-time conditions.
CVP operational forecasts or outlooks represent general system-wide dynamics and do not necessarily address specific watershed/tributary details.
CVP releases or export values represent monthly averages.
CVP Operations are updated monthly as new hydrology information is made available December through May.

February 20, 2015

Upper Sacramento River – February 2015 Preliminary Temperature Analysis

Temperature Model Inputs, Assumptions, Limitations and Uncertainty:

1. Operation is based on the February 2015 Operation Outlooks (monthly flows, reservoir release, and end-of-month reservoir storage) for the 90 and50% exceedances.
2. The profiles used for Shasta, Trinity and Whiskeytown were taken on February 3, February 4, and February 3, respectively.
3. Guidance on forecasted flows from the creeks (e.g., Cow, Cottonwood, Battle, etc.) between Keswick Dam and Bend Bridge is not available beyond 5 days. Model input side flows (Cottonwood Cr & Bend Bridge local flow w/o Cottonwood Cr) were selected from the historical record, and are consistent with the forecast exceedance frequency. During spring, the relatively warm creek flows can be a significant percentage of the flows at Bend Bridge.
4. Although mean daily flows and releases are temperature model inputs, they are based on the mean monthly values from the operation outlooks. Mean daily flow patterns are user defined.
5. Cottonwood Creek flows, Keswick to Bend Bridge local flows, and diversions are mean daily synthesized flows based on the available historical record for a 1922-2002 study period.
6. Meteorological inputs were derived from a database of 86 years of meteorological data (1920-2005). The meteorological inputs in the model represent "Average" meteorological conditions.
7. Meteorology, as well as flow volume and pattern, significantly influences reservoir inflow temperatures and downstream tributary temperatures; and consequently, the development of the cold-water pool during winter and early spring.

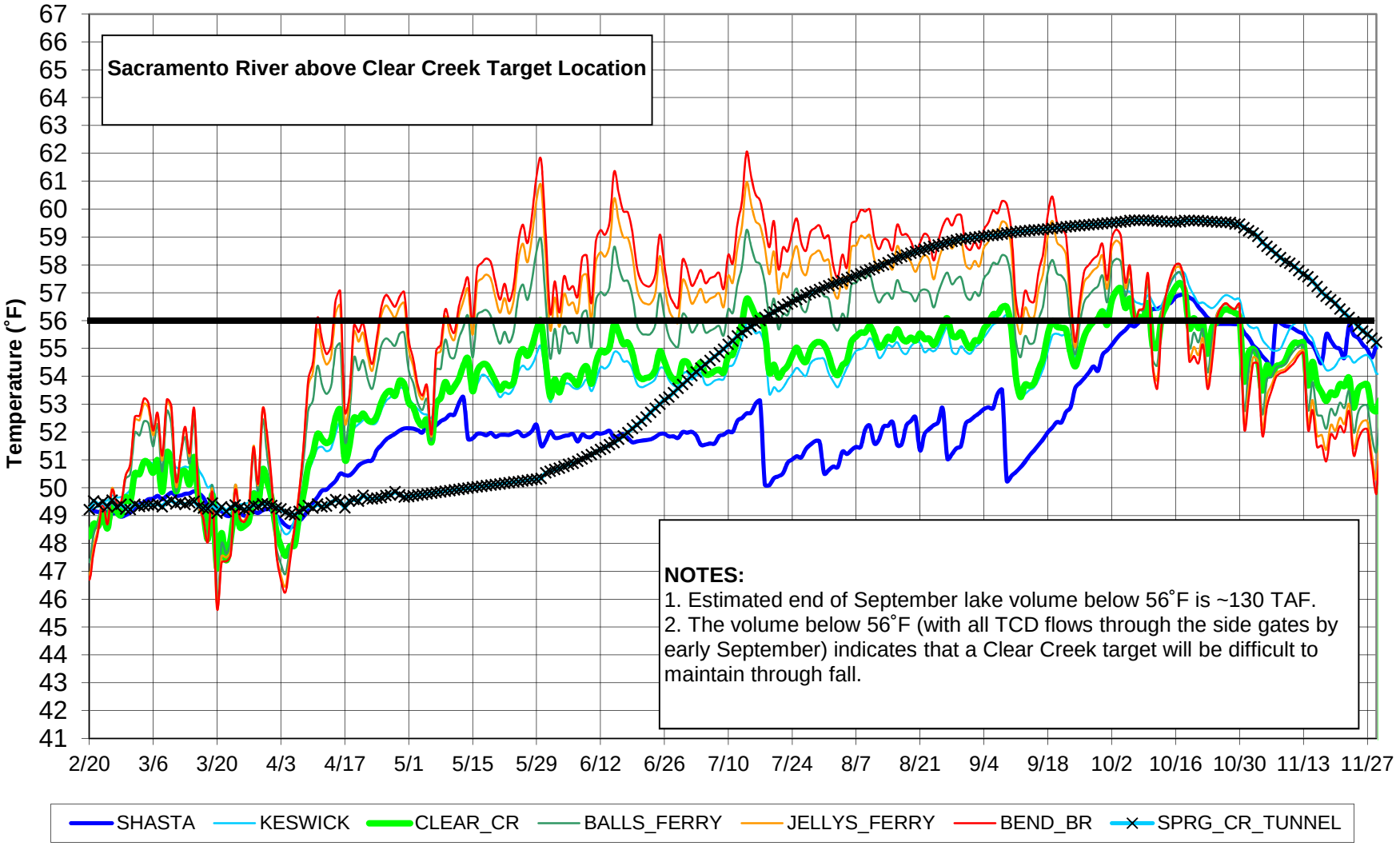
Temperature Analysis Results:

Note that for all exceedances, Lake Shasta storage is too low to utilize the upper gates of the TCD. This TCD limitation, along with the relatively small cold-water pool volume, significantly impacts temperature management.

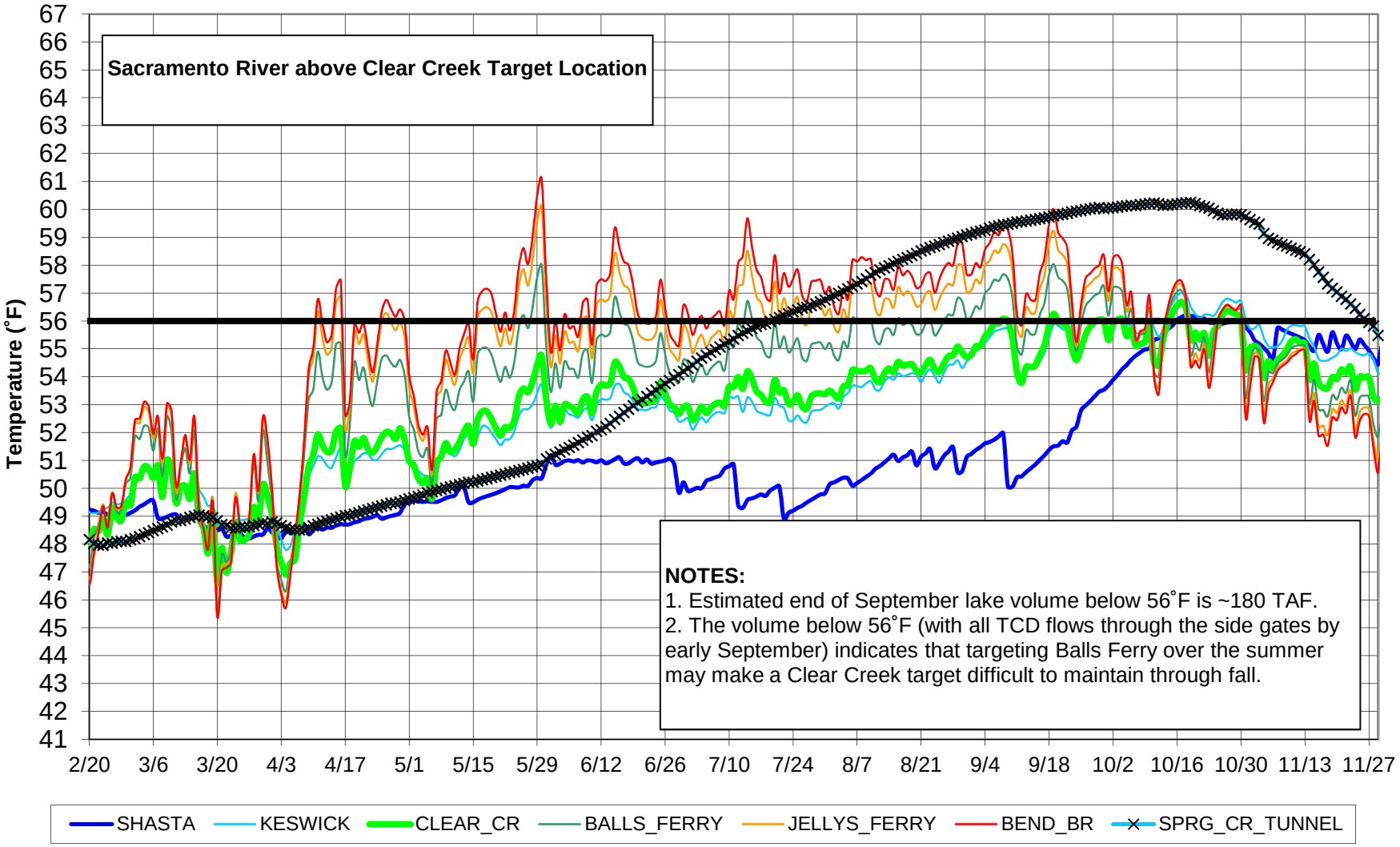
90%-Exceedance:
A temperature target location at Clear Creek is possible through mid-August or early September (Figure 1). By September, the TCD intake level will be through the side gates. Shasta Dam release temperature is expected to exceed 56˚F by September.

50%-Exceedance:
A temperature target location at Clear Creek is possible through the temperature season (Figure 2). By September, the TCD intake will be through the side gates. Early summer operation to a Balls Ferry target may be possible but it would be at the risk of exceeding compliance at Clear Creek in the fall. Shasta Dam release temperature is expected to exceed 56˚F by early October.

Sacramento River Modeled Temperature
2015 February 90%-Exceedance Outlook



Sacramento River Modeled Temperature
2015 February 50%-Exceedance Outlook



Clear Creek - Igo Modeled Temperature
2015 Februsary 90%-Exceedance Outlook